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THE
LARYNGOSCOPE.

VOL. LIV DECEMBER, 1944. No. 12

HEMATOLOGY.

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Memphis.

The literature of hematology for the past year has offered but few new ideas, and the absence of the foreign journals depleted the list of contributors. The Rh blood factor has been studied by more authors than any other phase of the subject, with a reduction in the number of severe reactions following transfusions.

RH BLOOD FACTORS.

Eighty-five per cent of the white population possess positive Rh factors, but if a patient with a Rh negative serum receives a transfusion of Rh positive cells, there will be developed anti-Rh agglutinins in the recipient's blood. This transfusion may be uneventful, but subsequent transfusions of Rh positive blood cells will be followed by agglutination of the Rh positive cells. Norcross[1] illustrates this same reaction when Rh negative mothers conceive an Rh positive fetus. The first child born may not have an erythroblastosis fetalis, but subsequent children will suffer and many die young or are miscarried before birth. Potter[2] examined 60 mothers giving birth to babies with this disease. Six of them had Rh negative blood, while six of the 59 infants and fetuses had Rh positive blood. Race[3] studied 50 families in which the disease occurred and found 44 mothers to have Rh negative blood. No mother who bore an erythroblastotic baby subsequently had a normal child. Early transfusions for these children are the only hope, expressed by Wiener and Wexler,[4] using Rh negative blood from group O donors. The mother's

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blood should be avoided because of the isoantibodies and the father's Rh positive blood will be agglutinated. The best blood is an Rh negative blood of the same group as the mother's. Kariher and Spindler[5] recommended changing the nomenclature to hemolytic diseases of the newborn. Levine and Wong[6] studied 150 Chinese and found only one Rh negative blood.

Recently, the author attended a bleeder not of the true hemophilia type who required multiple transfusions. The reactions were increasing in severity to an alarming degree. Rh studies revealed that he was of the negative group and by limiting future blood to the Rh negative group, the reactions failed to follow subsequent transfusions.

ANEMIAS.

Pernicious Anemia: Cox[7] contends that the atrophy of the glands of the fundus of the stomach is important and that total removal of the stomach is dangerous. Fox and Castle[8] suggest that the fundus and body of the stomach are the origin of the intrinsic factor necessary for the production of blood. The standard treatment remains the administration of liver extracts. Delikat[9] observed that some patients given intramuscular doses became sensitive though they had not been previously allergic. This sensitivity extended to all brands and types of liver extract. Merriman[10] confirms the work of Delikat and suggests desensitization by the use of fractional doses of the extract. Harris and Harris[11] linked up sprue with pellagra and pernicious anemia and outlined the symptoms common to three conditions, especially those occurring in the mouth and on the tongue.

HEMORRHAGE.

The control of surface bleeding is being experimented with by the use of thrombin preparations. At present one commercial preparation is "Thrombin Topical" (Parke, Davis & Co.). The greatest value of this preparation in otolaryngology is its direct application to the persistent bleeders in the adenoid region. The contraction of the superior constrictor muscle plays an active part in the control of adenoid bleeding, and pressure should be applied to the adenoid region until the return of its power of contraction has followed the

cession of the general anesthetic. In children with paralyzed throats the use of a local coagulant is advised. In order that any of these preparations of thrombin be effective, the field should be made dry by pressure or the local application of adrenalin in order to give thrombin extract a chance to coagulate the blood within the vessels.

Alt[12] and his associates administered red blood cell transfusions to 100 patients following severe hemorrhages with little or no reaction. In preparing the red cell suspension, 500 cc. of donor blood were collected in a bottle containing 50 cc. of 4 per cent sodium citrate and were thoroughly centrifuged. The plasma was aspirated and stored at 4° to 6° C. When the transfusion is administered, 500 cc. of this blood are diluted with 100 cc. of saline solution and given by the Baxter method. All transfusions should be checked for the Rh factor, as most of these severe reactions are the result of giving a positive Rh blood to a negative Rh patient.

HEPARIN AND DICUMAROL.

McLean,[14] in 1916, isolated an anticoagulant and, in 1918, Howell and Holt[15] named it Heparin. Originally, it was used only in physiological laboratories. Veterinarians appreciated that cattle were subject to hemorrhagic diseases. Schofield[16] and Roderick[17] independently reached the conclusion that it was due to the eating of spoiled sweet clover. Link[18] and his associates isolated a compound 3,3′-Methylenebis (4-hydroxycoumarin) and gave it the name of Dicumarol.*

Heparin occurs in many organs, especially in the liver and lungs, also in the mast-cells of Ehrlich. Heparin blocks the action of prothrombin in the plasma and its action is immediate but transitory. To be effective it should be given intravenously and continuously by the drop method. This procedure is safe, due to the low toxicity of heparin. Repeated determinations of the clotting time will standardize the individual dosage.

The anticoagulation properties of Dicumarol result from its ability to prevent the formation of thrombin by the liver and has no influence on the prothrombin already present in

*Dicumarol is the collective trademark of the Wisconsin Alumni Research Foundation which controls the use thereof. It is as yet not commercially available in the United States.

the plasma. Its action is delayed but lasts for several days after the administration is discontinued. It is given orally and controlled by frequent repeated prothrombin time determinations, accepted dosage being 5 mg. per kg. of body weight and 1.5 mg. per kg. daily thereafter. The prothrombin time should not be beyond 19 seconds or, roughly, 25 per cent of normal. It should not be administered in cases of ulcerating or granulating wounds or patients having gross hepatic damage with or without jaundice.

COMPARISON OF HEPARIN AND DICUMAROL

	Heparin	Dicumarol
Source	Mast-cells of Ehrlich	Spoiled sweet clover
Mode of action	Blocks action of prothrombin	Blocks formation of prothrombin
Onset of action	Immediate	Delayed 24-72 hours
Duration of action	Transitory	Prolonged
Method of administration	Intravenous	Oral
Toxicity	That incidental only to hemorrhage	That incidental only to hemorrhage
Dosage	Controlled by clotting time	Controlled by prothrombin time

The clinical application of either of these drugs is best seen in the abortion of an oncoming cavernous sinus thrombosis. In order that the sulfonamides may be effective, the blood stream must remain patent, and these drugs, though acting differently, accomplish the same purpose.

HODGKIN'S DISEASE.

Jackson and Parker[13] suggest three classifications: first, paragranuloma; second, granuloma; and third, sarcoma. The Reed-Sternberg bodies may be found in each of these groups and one type may change into the other with the passage of time, the transformation being from the benign to the malignant form. The first group have their initial involvement in the cervical lymph nodes, suggestive of pharyngeal infections; the second group, granuloma, have inflammatory and neoplastic morphology; the third type, sarcoma, seem to have a true neoplasm with uniform cellular constituents usually fatal and attacking the older groups of patients. The authors discuss the possibility of the tubercle bacillus as the etiology and contrast it to allergy and conclude that the etiology of Hodgkin's granuloma has yet to be discovered.

LEUKEMIA.

Haden,[19] of the Cleveland Clinic, identifies five principal types of leukemia as monocytic, acute myeloid, chronic myeloid, acute lymphoid and chronic lymphoid. Acute cases occur before the age of 20 and the chronic usually after 40. The common site of suspected infection is usually oral or rectal. Oral infections are manifested as hypertrophy of the gums, and the condition is treated locally. Uniform enlargement of one tonsil is to be considered leukemic until ruled out by a thorough blood study.

LEUKOPENIA AND AGRANULOCYTOSIS.

Mirick[20] reviewed 17 cases and added one additional instance where the toxic reaction to gold salts was a leukopenia. Many authors, including Goldman, Applebaum and Antopol,[21] again report cases of agranulocytosis following the administration of the sulfa drugs. Of 17 fatal cases, the administration had extended for more than 10 days. Bethell[22] is of the opinion that the leukopenia is an allergic reaction and not dependent upon the total quantity of the sulfonamide medication or the amount contained in the blood. "There is, therefore, no substitute for the careful observation of the patient, including total and differential leukocyte counts, during and for some days after the administration of these drugs."

Day, *et al.*,[23] named a new factor in diet "vitamin M," which will restore the normal percentage of leukocytes in a monkey with granulocytopenia, the result of nutritional deficiency.

Derivatives of nucleic acid, pentnucleotides and yellow bone marrow retain their popularity in the treatment of agranulocytosis.

Death of a patient with agranulocytosis is due to sepsis, which justifies the judicial administration of the sulfonamides.[24,25,26]

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LARYNGECTOMY FOR LARYNGEAL CANCER. REVIEW OF 45 CASES.*†

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Cleveland.

Until the advent of some as yet undiscovered chemical or biologic agent to combat cancer, surgery offers the best hope in treatment of carcinoma of the larynx. As Clerf[1] has so aptly stated it: "We do not cure cancer with surgery; we remove it." Surgery, therefore, in cancer of the larynx must be thorough and complete, and hence radical. Many more patients would be saved if it were always remembered that there must be no compromise in dealing with carcinoma. Mackenty,[2] who was the first to demonstrate that results of total laryngectomy for cancer are worthwhile, emphasized the need for radical operation. As he pointed out, carcinoma of the larynx is nearly always of squamous cell type, and highly malignant, and with any procedure less radical than laryngectomy there is no assurance that the growth is completely removed.

Although Mackenty limited this operation to cases of intrinsic carcinoma and felt that growths of extrinsic type could not be successfully operated upon, we believe, from the results achieved with removal of some advanced and extensive growths, that many patients with extrinsic cancers of the larynx should not be refused laryngectomy. It would b preferable, of course, if all operations could be performed on intrinsic lesions; but in actual practice, a preponderance of extrinsic lesions is encountered. The results of extensive dissections and total laryngectomy in many cases more than justify the risk of the procedure.

The most important objections to total laryngectomy that have been raised by those who advocate more conservative surgery are destruction of the normal air passage and loss of the speaking voice. Close observation of these patients

*Read in an abbreviated form before the Akron Eye, Ear, Nose and Throat Society.

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after total laryngectomy has shown that the incidence of acute nasopharyngitis (the common cold) is far less than in persons with normal air passages. Whether this is due to placing the mucous membrane of the nose and pharynx at rest, or to lessened exposure to infection due to loss of normal inspiration and expiration, is not known. Very few cases of bronchitis have been seen in these patients, and where it did occur the infection was nearly always secondary to a symptomless acute maxillary sinusitis. None of the patients in this series has had pneumonia, and many of them have been exposed to all kinds of adverse weather conditions.

In answer to the second objection, we can now give these patients reasonable assurance of a good esophageal voice, if they cooperate in carrying out preliminary exercises before operation and give sufficient time and effort to training afterwards.

Voice Training: Twenty-four patients in this series were subjected to preliminary training for development of the esophageal voice before operation was performed. This procedure is now used routinely for all patients who are to have laryngectomy. Since the most crucial concern of the patients, next to survival, is ability to talk, postponement of the operation for a week or so for the purpose of assuring them a good esophageal voice afterwards is justified. The procedure used has been described previously.[3]

The esophageal voice results from timing and synchronization of movements of the lips, tongue and teeth, with adequate expulsion of air from the esophagus and pharynx. Definite narrowing of the cricopharyngeal space after laryngectomy creates sound vibrations when a sufficient volume of air is expelled from the esophagus; therefore, development of the esophageal voice is dependent on the patient's ability to expel forcibly an adequate volume of air from the esophagus, which constitutes the act of belching. If this is not developed, the patient will not be able to talk with an esophageal voice. It is much easier to learn to belch properly before the larynx is removed than afterwards. If training is delayed until after operation the glottic valve check to respiration is gone, and the patient usually explodes air from the trachea instead of the esophagus.

The surgeon should provide systematic training for acquiring the belching effort before operation. This is learned easily by some patients; others find it quite difficult. To aid in learning to trap air in the esophagus, carbonated drinks are prescribed. Patients are told to inhale deeply, then to cease active respiration while eructating air from the stomach and esophagus. The longer this is maintained, the greater the volume of air that will move up and down the esophagus.

After operation, as soon as the feeding tube is removed, the patient is required to resume the belching effort. At first much more stress is placed on belching than on the effort to form words. The words "Oh," "O. K.," and "Hello" seem to be easiest to form. In the beginning the patient is tempted to try to form sentences and this should be discouraged, because progress is much more rapid with practice in forming one word at a time. When ability to form words has been mastered, it is easy to put phrases and sentences together.

The greater the cooperation between surgeon and patient during the postoperative period, the better the results. The surgeon should see the patient often, for there are many times when he and his family are discouraged and need reassurance. Few patients, however, neglect to make the necessary effort to develop an esophageal voice. It should be insisted that two or three hours a day be devoted to learning this skill. If the patient segregates himself from family and friends, he is more likely to practice diligently than if others are around. It is well to enlist the sympathy and cooperation of the wife in this undertaking, for she can do much to encourage and reassure the patient and to stimulate practice.

Of the 24 patients in this series who had preliminary training, only four failed to develop ability to speak with an esophageal voice after operation (Cases 17, 22, 25, 44). Most of the 21 patients who did not have preliminary voice training were operated on before this regimen was initiated, and a few others were too old or too sick to make it feasible. In this group, only six developed a good esophageal voice with training and practice after operation. Despite the fact that the series is too small to be statistically significant, these results suggest strongly that preliminary voice training is

distinctly valuable in overcoming this most serious handicap incident to laryngectomy.

Surgical Technique: In this series, the one-stage laryngectomy has been done, with subperichondrial dissection, as described by Crowe and Broyles,[4] severing the superior corum of the thyroid cartilage and removing the larynx from below upward. Troublesome oozing is overcome by injecting the mucous membrane of the trachea at the site of amputation with 1 per cent novocain and adrenalin (15 minims per ounce). A good closure prevents leakage, lessens danger of cellulitis and shortens convalescence. After the larynx is removed and the pharynx closed, the wound is filled with a mixture of two parts sulfathiazole and one part sulfanilamide. A Penrose drain and Dakin tubes are placed above and below, lateral to the incision, and the wound is irrigated through the Dakin tube with a 5 per cent sodium sulfathiazole solution every six hours. About the sixth or seventh day, if there is no apparent pharyngeal leakage, the patient receives water to swallow. If the pharyngeal opening has closed, the feeding tube is removed.

From 1936-1941, avertin and local anesthesia were used. Since 1941, avertin has been replaced by sodium pentothal intravenously, because the period of anesthesia is shortened and the dosage more easily controlled. Thus the dangers of atelectasis and other pulmonary complications are decreased. In the last two cases an intratracheal inflatable cuff, which prevents bleeding into the trachea and bronchi, has been used. This was suggested by B. B. Sankey, Chief Anesthetist at St. Luke's Hospital, and promises to be a most helpful adjunct.

Results: The series reported includes results in 45 patients subjected to laryngectomy from 1936 to July, 1944. The salient features of these cases are presented in Table 1. All but two of these patients had squamous carcinoma; the exceptions were extensive chondroma. These two cases of chondroma have been reported in a previous publication.[5] During this same period, four laryngofissures were performed, and 12 additional patients with cancer of the larynx were seen, whose lesions were too far advanced to permit laryngectomy, or who refused operation. In most of these instances, palliative tracheotomy was the only procedure that could be

used. One patient received radium treatment. During the same period also, nine patients had benign tumors removed from the larynx.

In the forty-five cases in which laryngectomy was performed, there were no immediate postoperative deaths. One elderly patient (Case 27) died six days after he left the hospital of a "heart attack," and another died in the hospital (Case 43) 20 days after operation of coronary thrombosis, which was proved by autopsy. Twelve patients died with recurrence or extension of the malignant process at varying periods after operation. Thirty-one patients are alive. Nine of these were operated on during the past year. Six have survived one to two years; three for two to three years; four from three to four years; three for four to five years; one, over five years; two, six to seven years, and one for eight years. Two of the living patients had chondroma.

Of those who have survived more than five years, the cancer was intrinsic in all instances. In two, only one vocal cord was involved, and in two both cords and anterior commissure were invaded. Of the six who have survived three to five years, the laryngeal growth was intrinsic and of well differentiated type, in two. In one of these the growth was relatively early, involving the right ventricle, cord and anterior commissure; in the other, a grade I squamous carcinoma involved the cords and intralaryngeal tissue. In the other four three-to-five-year survivals, the growth was primary in the hypopharynx in one, involved both cords with invasion of muscles and veins in another, was primary in the right cord in another, with extension to the left cord, pharynx, epiglottis and esophagus, and in the fourth the carcinoma arose from the base of the epiglottis on the laryngeal side. Two of these growths were of poorly differentiated histologic type.

Of the patients now living, only one, as far as is known, has had a recurrence. This patient (Case 38) had a recurrence a year and four months after operation, for which she received Roentgen treatments. At her last examination, eight months after Roentgen therapy, there was no evidence of malignant growth. Case 45 deserves some special comment, since the patient had an operation for laryngeal cancer

by another surgeon 12 years ago. Laryngofissure was performed at that time; the growth was intrinsic, grade II. Recently, at age 72, the patient had a recurrence or a new growth in the larynx, for which total laryngectomy was performed. This second growth was still intrinsic, and still diagnosed by the pathologist as grade II squamous carcinoma.

The sex incidence of carcinoma of the larynx is preponderantly male. In the 45 cases in this series, there were only five women. The sex ratio reported by others has varied from one to nine to one to fourteen.[6]

The age distribution was similar to that previously reported by others. The majority of the patients were aged 50 to 70. One was under 40; seven, aged 40 to 50; 20, 50 to 60; 14, 60 to 70, and three over seventy.

Hoarseness was the outstanding symptom, and was present in all cases. In more advanced cases, dyspnea, cough and dysphagia were present in varying degrees. As other authors have emphasized, every effort should be made to educate the public that persistent hoarseness is a serious symptom and should be investigated promptly.

Discussion: As already mentioned, of the 43 cases of laryngeal carcinoma in this series, the majority of the lesions were of extrinsic type. There were 24 extrinsic and 19 intrinsic growths. In view of the gravity of the prognosis in extrinsic lesions, the fact that 29 of the total group are alive and free from cancer, and that 11 have survived more than three years, and that four of the latter had extensive and invasive extrinsic lesions at the time of operation, makes the results at least encouraging. Of those who died of recurrences, nine of the 12 patients had extrinsic lesions, several of them extremely advanced and extensive. Seven of this group died less than six months after operation. Three lived less than a year, and three lived one to two years after operation.

There is still considerable difference of opinion as to the type of surgical treatment that should be used for cancer of the larynx. Laryngofissure is still advocated and used by many surgeons, but our experience indicates that the more radical procedure of laryngectomy is preferable in all cases,

no matter how early or how limited the lesion may be. Our results also show that total laryngectomy and wide dissection may produce effective results, even in some extensive and advanced cases of extrinsic carcinoma; hence we believe that the patient, if he is able to withstand the operation, should be given the chance that this procedure offers, even though the results are bound to be unsatisfactory in some cases.

Although this opinion is somewhat more radical than that expressed by others, according to recent reports in the literature there seems to be a definite trend toward more frequent performance of laryngectomy, with less emphasis on laryngofissure. Jackson and Blady[7] state that lesions in which the growth is cordal but has reached the posterior end of the cord and produced impairment of motility or has extended subglottically, ordinarily call for total laryngectomy. They also advocate laryngectomy for lesions in which the tumor has invaded cartilage but not muscles, providing there are no metastases. Hammond[6] advocates laryngofissure for cordal lesions in the early stage regardless of the grade of malignancy, when there is free motility of the cords; but he advises laryngectomy for intrinsic lesions of low malignancy in the advanced stage, with fixation of vocal cords and also advises irradiation for extrinsic lesions. Cunning[8] uses laryngofissure only in cases having a relatively small growth on one cord which does not extend across the midline at the anterior commissure; for all others he performs laryngectomy. Clerf[1] reports 101 laryngectomies performed in 250 surgical cases of cancer of the larynx and states that laryngectomy yields better results than laryngofissure in cases of subglottic cancer.

Martin[9] believes total laryngectomy is necessary for more advanced intrinsic cancers of the larynx. The growth may have deeply invaded the ventricle, extended into the ventricular bands across the anterior commissure to the opposite cord, up onto the posterior surface of the glottis or down into the subglottic region. In more extensive growths where there is some doubt as to the exact site of the growth, decision for or against total laryngectomy should depend somewhat on histologic study. Should the growth be grade I or

II, decision might be in favor of laryngectomy. If less differentiated and more anaplastic, irradiation or implantation of radium might be better. In view of this opinion, it is interesting to note that in our series, two patients with extrinsic lesions showing wide invasion, who have survived more than three years, had growths of poorly differentiated, highly malignant type, according to the pathologist's diagnosis.

Peck, Maxwell and Lamberson[10] in a total series of 170 cases treated only 13 patients by total laryngectomy. They regard hemilaryngectomy as preferable in cases in which it is applicable. Figi[11] also advocates a most conservative attitude in surgical treatment of cancer of the larynx.

Crowe and Broyles[4] do not advocate surgery when the growth has invaded cartilage, muscles or glands; in such cases they use irradiation only. Laryngectomy is chosen for intrinsic lesions when the anterior commissure is involved or the vocal cord fixed. They report disappointment in their end-results, due, they believe, to improper selection of cases.

Although these opinions indicate considerable divergence, there is fairly definite agreement that laryngectomy constitutes the best hope of cure in most cases of intrinsic carcinoma of the larynx. The disagreement and uncertainty concerns chiefly the least advanced and the most advanced cases. The less radical procedure of laryngofissure is advocated by some for the former, with the hope that it will control the situation without subjecting the patient to the disability entailed by total loss of the larynx. The disagreement as to the most advanced cases seems to arise from the question of whether the results to be expected justify subjecting the patient to such formidable surgery.

It is certain, of course, that when laryngectomy is performed on any considerable number of patients with extensive, advanced extrinsic lesions, the total end-results are going to be much less favorable than when the operation is limited to intrinsic growths. Favorable statistics scarcely represent sufficient reason for denying these patients the one chance that may be given them of relieving them and prolonging their lives.

Although many advocate only irradiation for this type of case, there is no conclusive evidence that it produces results as satisfactory as those of laryngectomy. Lenz,[12] who discusses the situation from the standpoint of the radiologist, states that Roentgen treatment of cancer of the larynx is a serious undertaking; the reaction to it is severe and is not tolerated by all patients. Debilitated patients may not be able to withstand treatment and the serious reaction which follows it. In such patients, dosage is often reduced, and failure results. He states that total laryngectomy should be given every consideration in advanced intrinsic lesions, and that in far advanced cancer when cartilage and soft tissues have been invaded, total laryngectomy followed by irradiation may still save some patients. He, a radiologist, advocates total laryngectomy with irradiation in the same type of case that many laryngologists recommend should be treated by irradiation alone, perhaps because he realizes better than they the limitations of radiation treatment.

In this connection, a report by Brunschwig[13] is interesting. In five patients with advanced extrinsic carcinoma of the larynx in which irradiation had failed to control the growth, radical surgical excision, encompassing the limits of the growth, was carried out as a palliative measure. One patient died of hemorrhage 40 days after operation. Three others survived one year, 18 months, and six months, respectively. One patient was living without recurrence four years after the operation. This report substantiates our opinion that radical operation may be worthwhile and deserves a trial, even in extremely advanced cases of extrinsic carcinoma.

Although the results reported in this series are not what we might wish for in treatment of carcinoma of the larynx by laryngectomy, it appears that they justify a more hopeful attitude toward this condition than is held by many otologists. It is hoped that this report may stimulate others to reconsider the problem of treatment of laryngeal cancer, particularly in early intrinsic growths and in the most advanced lesions.

Summary and Conclusions: Cancer of the larynx presents a problem that is being met with increasing frequency in otolaryngologic practice. In a study of the incidence of this condition, Jackson and Jackson[14] felt that the conclusion is warranted that there is a small but progressive increase from year to year. They state that about one person in every 100 dies each year and about one in every 100 deaths is due to cancer. About one of every 100 cancer deaths is from cancer of the larynx. In addition to continuous study and discussion as to the most effective methods of treating this condition, otolaryngologists also must assume great responsibility in rehabilitation of its victims and in educating the public regarding the disease, particularly regarding the significance of the symptom of hoarseness, so that earlier diagnosis and treatment may be possible. With present knowledge, this offers best hope of improving the results.

A series of 45 cases in which laryngectomy was performed is reported. Two operations were done for extensive chondroma of the larynx. The remaining 43 patients had squamous carcinoma. There were no immediate postoperative deaths. Twenty-four cases of carcinoma were extrinsic, some of them extensive and advanced, and 19 were extrinsic. Two patients died of causes unrelated to cancer, and 12 died of recurrence within two years after operation. Thirty-one patients (29 with carcinoma) are living. Eleven patients with carcinoma have survived for more than three years, without recurrence. The longest survival period in this series is eight years.

Preliminary training, which involves principally acquiring the ability to belch, is effective in helping the patient to develop a satisfactory esophageal voice after operation. Of 24 patients who had this preoperative training, only four failed to develop a satisfactory voice.

CLINICAL DATA ON LARYNGECTOMIZED PATIENTS.

No.	Age	Sex	Symptoms and Duration	Diagnosis	Preoperative Voice Training	Esophageal Voice	Results and Comments
1	51	M	Hoarseness 6 mos. No pain. Cough.	Squamous carcinoma, both cords.	No	Yes Good	Alive 6 yrs. after operation.
2	55	M	Dysphagia. Weight loss 35 lbs., 3 mos. Dyspnea. Pain.	Poorly differentiated squamous carcinoma, primary in hypopharynx.	No	Excellent	Alive 4 yrs. after operation.
3	60	M	Hoarseness. Pain in rt. ear, 8 mos. Dysphagia. Weight loss.	Squamous carcinoma, grade III, right portion of larynx.	No	No	Died of recurrence 5 mos. after operation.
4	56	M	Had previous tracheotomy and tracheotomy tube in place.	Poorly differentiated squamous carcinoma, anterior 2/3 rt. vocal cord and anterior commissure, extending to left cord.	No	No	Alive 6 yrs. after operation.
5	56	M	Hoarseness, intermittent, 4 yrs.; continuous, 9 mos.	Squamous carcinoma, grade II, left cord. No evidence of disease in epiglottis and arytenoid.	Yes	Excellent	Alive 2 yrs. after operation.
6	67	M		Well differentiated squamous carcinoma of larynx with invasion of glands, veins, cartilage and bone.	No	No	Dead—recurrence 6 mos. after operation.
7	52	M	Cough and pain, 1 yr. Dysphagia, 3 mos. Weight loss, 15 lbs.	Left cord, squamous carcinoma, lymph node involvement.	No	No	Pharyngectomy, resection of esophagus, skin graft. Died 8 mos. after operation.
8	40	M	Hoarseness, 8 wks.	Squamous carcinoma, grade II, well differentiated, rt. ventricle and rt. true vocal cord and anterior commissure. Relatively early growth.	Yes	Excellent	Alive 4 yrs. after operation.
9	59	M	Cough, 18 mos. Pain, dyspnea and dysphagia, 2 mos.	Squamous carcinoma, grade III, of most of rt. cord, 2 mm. of left and anterior commissure, with destruction of cartilage.	Yes	Good	Alive 2 yrs. after operation.

CLINICAL DATA ON LARYNGECTOMIZED PATIENTS (Continued).

No.	Age	Sex	Symptoms and Duration	Diagnosis	Preoperative Voice Training	Esophageal Voice	Result and Comment
10	66	M	Hoarseness, 2 yrs. Pain, 4 mos. Dysphagia, 6 mos. Weight loss, 28 lbs. in 5 mos. Dyspnea, 2 wks.	Squamous carcinoma, grade II, left cord, left arytenoid, left pyriform sinus, and extrinsic muscles.	Yes	Very Good	Alive 1½ yrs. after operation.
11	33	F	Hoarseness, 1 yr. Cough, 4 mos. Pain, 4 mos. Weight loss, 15 lbs., 2 mos.	Squamous carcinoma, grade III, rt. cord, extending to base, right side of epiglottis.	Yes	Excellent	Alive 9 mos. after operation.
12	64	M	Hoarseness, 3 yrs. Weight loss, peristent cough.	Squamous carcinoma, grade II, both cords, with invasion of muscles and veins.	No	Good	Alive 4 yrs. after operation.
13	55	M	Progressive hoarseness and intermittent dry cough, 1 yr. Cough later productive. Some anorexia and nausea. Cough and hoarseness worse, for 3 wks, after beginning antisyphilitic treatment. Some dyspnea. No pain. Previous tracheotomy.	Squamous carcinoma, well differentiated, rt. cord and subglottic area and left cord.	No	No	Died in hospital with recurrent carcinoma and metastases to local lymph nodes, 13 mos. after operation.
14	53	M	Hoarseness and dysphagia, 3 mos. Weight loss, 35 lbs. Pain on rt. side of larynx. Was treated for laryngitis without relief.	Squamous carcinoma, grade III, with extension into epiglottis.	No	No	Entered hospital 5 mos. after operation with dyspnea, in extremis, and died on same day.

(Continued)

CLINICAL DATA ON LARYNGECTOMIZED PATIENTS (Continued).

No.	Age	Sex	Symptoms and Duration	Diagnosis	Preoperative Voice Training	Esophageal Voice	Result and Comment
15	52	M	Hoarseness, 1 yr.	Squamous carcinoma, grade III, left cord, with extension across commissure.	Yes	Excellent	Alive 2½ yrs. after operation.
16	72	M	Hoarseness, 1 yr. Mass in neck, dyspnea, dysphagia, 6 wks.	Squamous carcinoma, grade II, left cord, anterior commissure, extending through thyroid cartilage into muscle, lymph nodes.	Yes	Good	Alive 1 yr. after operation.
17	53	F	Hoarseness, 6 mos.	Squamous carcinoma, grade III, rt. cord, extending to base rt. side epiglottis.	Yes	No	Died of recurrence 18 mos. after operation.
18	42	M	Hoarseness, 3 yrs. 2 previous biopsies negative for cancer. Third biopsy positive.	Squamous carcinoma, right cord.	No	Excellent	Alive without recurrence 8 yrs. after operation.
1		M	Hoarseness, 7 mos. Malaise and weight loss, 2 mos.	Squamous carcinoma, grade III, left cord.	No	No	Died of recurrence 9 mos. after operation.
20		M	Hoarseness, 3 yrs. Dyspnea and cough, 2 yrs. Pain, 6 mos.	Squamous carcinoma, grade III, rt. true and false cords, medial 1/3 left true and false cords. Extension to neck muscles. Enlarged nodes.	Yes	Very good	Alive 2 yrs. after operation.
21			Hoarseness, 1 yr. Dyspnea, 1 mo.	Squamous carcinoma, both cords, left arytenoid, epiglottis.	No	No	Died 1 year after operation.
22			Hoarseness, 4 mos.	Squamous carcinoma, left false cord, grade III. Benign ulceration, both cords.	Yes	Good	Alive 1½ yrs. after operation.

CLINICAL DATA ON LARYNGECTOMIZED PATIENTS (Continued).

No.	Age	Sex	Symptoms and Duration	Diagnosis	Preoperative Voice Training	Esophageal Voice	Result and Comment
23	59	M	Hoarseness, 6 weeks. Slight productive cough.	Squamous carcinoma, right cord.	No	Very good	Alive 5 yrs. after operation. No recurrence.
24	53	M	Hoarseness, 1 mo.	Squamous carcinoma, well differentiated, left cord; extension base of tongue, epiglottis, pharyngeal wall, Thyrohyoid area.	No	No	After operation had swelling in neck and later inability to swallow food, with weight loss and death 6 mos. after operation.
25	54	M	Hoarseness, 4 mos.	Squamous carcinoma, grade II, well differentiated, rt. cord, extension to left cord, pharynx, epiglottis, esophagus.	Yes	Poor	Alive 3 yrs. after operation.
26	63	M	Hoarseness, 4 mos.	Squamous carcinoma, grade I, vocal cords and intralaryngeal tissue. Aberrant thyroid tissue in larynx.	Yes	Excellent	Alive 3½ yrs. after operation.
27	77	M		Squamous carcinoma, grade III, epiglottis, rt. arytenoid, invasion of false cords.	No	No	Epiglottis removed and total laryngectomy. Died 6 days after leaving hospital with sudden heart attack(?).
28	45	M	Hoarseness, 2 years. Weight loss, 35 lbs. in 6 mos. Dyspnea, dysphagia, slight pain.	Squamous carcinoma, grade III, both cords. Extension below 3rd tracheal ring and anterior esophagus.	No	Yes	Died in hospital 4 mos. after operation, admitted for relief of laryngeal distress.
29	45	M	Hoarseness, 13 mos. Dyspnea, 3 mos. Slight pain, 2 mos.	Squamous carcinoma, poorly differentiated, rt. true and false cords. Involvement soft tissues of neck, epiglottis.	Yes	Excellent	Roentgen evidence of metastasis in chest 8 mos after operation. Died 1 yr. after operation. Patient refused operation for 1 yr. before he finally submitted to it.

(Continued)

CLINICAL DATA ON LARYNGECTOMIZED PATIENTS (Continued).

No.	Age	Sex	Symptoms and Duration	Diagnosis	Preoperative Voice Training	Esophageal Voice	Result and Comment
30	55	M	Pricking sensation in throat, 1 yr., with difficulty in swallowing. Slight dry, nonproductive cough. Weight loss, 10 lbs., 6 mos. Weakness and increasing hoarseness, 2 mos.	Squamous carcinoma, grade II, arising from base of epiglottis on laryngeal side.	No	Good	Alive 4 yrs. after operation.
31	66	M	Hoarseness, 6 mos. No pain.	Squamous carcinoma, grade III, rt. vocal cord.	3 days	Excellent	Most of tumor was removed with biopsy. Alive 6 mos. after.
32	62	M	Hoarseness and dyspnea, 1 yr.	Squamous carcinoma, grade II, anterior portion both true cords and anterior commissure. False cord and ventricles not involved.	Yes	Good	Alive 7 mos. after operation.
33	60	M	Hoarseness, 8 mos.	Squamous carcinoma, undifferentiated, rt. vocal cord and anterior commissure. Infiltrating nodule in left cord.	Yes	Fair	Developed pharyngeal fistula after Operation. Admitted 2 mos. later for plastic procedure, but wounds were granulating and additional operation not done. Alive 1 yr. after operation.
34	67	M	Hoarseness and dyspnea, 2 yrs., 9 mos. Improved for a time and reappeared after "cold" about 1 yr. ago.	Chondroma of larynx, benign.	Yes	Excellent	Well 1½ yrs. after total laryngectomy.
35	47	M		Extensive chondroma of larynx, recurrent with widespread invasion of pharynx and neck.	No	No	Extensive plastic procedures required after laryngectomy. Alive 2 yrs. after laryngectomy.

CLINICAL DATA ON LARYNGECTOMIZED PATIENTS (Continued).

No.	Age	Sex	Symptoms and Duration	Diagnosis	Preoperative Voice Training	Esophageal Voice	Result and Comment
36	58	M	Hoarseness, 2 yrs.	Squamous carcinoma, grade III, left ventricle, false cord, and anterior commissure, extending up to involve left half of base of epiglottis.	1 wk.	Fair	Operation performed 3 mos. ago.
37	58	M	Hoarseness, 18 mos.	Squamous carcinoma, grade III, both ventricles and false cords, extending upward to entire base of epiglottis.	1 wk	Good	Only 3 mos. since operation.
38	61	F	Progressive hoarseness, 3 mos. No pain.	Squamous carcinoma of the larynx. No evidence of growth in arytenoid cartilage. Involvement of right vocal cord area.	Yes	Excellent Now teaching voice training to laryngectomized patients.	Father had "growth in windpipe." Patient had recurrence 1 yr. and 4 mos. after operation. Received Roentgen treatment. Alive 2 yrs. after operation.
39	66	M	Sore throat and growing mass at left angle of mandible. Had pneumonia after biopsy. Laryngectomy performed later without complication.	Squamous carcinoma of anterior hypopharynx, grade III; extrinsic. Operation involved removal of part of esophageal wall.	No		Alive 3 yrs. after operation.
40	61	M	Hoarseness, 5 mos., with ultimate complete voice loss; dysphagia, 4 mos.; hemorrhage, 6 wks.; 44 lb. weight loss.	Extensive extrinsic laryngeal carcinoma, grade III, with extrinsic metastatic growth rt. side of neck. Operation involved excision of rt. sternomastoid, ligation of internal jugular vein on right and block removal of rt. cervical glands, with total laryngectomy.	No	None	Died 1 mo. after operation with massive hemorrhage.

CLINICAL DATA ON LARYNGECTOMIZED PATIENTS (Continued).

No.	Age	Sex	Symptoms and Duration	Diagnosis	Preoperative Voice Training	Esophageal Voice	Result and Comment
41	48	F	Constriction in throat, 3 months. Increasing hoarseness after biopsy.	Squamous carcinoma, grade II, rt. vocal cord extending into ventricle.	Yes	Good	Granulations removed from tracheal opening 4 mos. after operation. Alive and well 10 mos. after operation.
42	47	F	Recurring sore throats and laryngitis; last attack followed by almost complete aphonia, 2 mos. Dyspnea, 1 mo. Biopsy elsewhere revealed neoplasm 1 wk. ago.	Undifferentiated squamous carcinoma, involving left cord, commissure and ventricle, 1.7x1.5 cm. with some involvement rt. side at commissure.	Yes	Fair	Patient diabetic. Operation performed recently.
43	66	M	Increasing hoarseness, 4 mos. Dyspnea, 4 wks. Cyanotic at examination. Emergency tracheotomy.	Squamous carcinoma of larynx, with involvement of entire left thyroid cartilage; glottic chink almost occluded. Enlargement left cervical nodes.	No		Died 20 days after operation from coronary thrombosis, confirmed by autopsy.
44	70	M	Hoarseness, 7 mos. Dyspnea, 1 mo. Severe coughing spells, 1 mo. Slight weight loss.	Squamous carcinoma, grade III. Rt. cord and commissure and muscles deeply involved. Slight invasion of left cord. Growth all contained within cartilaginous framework. No palpable lymph nodes.	1 wk.	No	Esophageal fistula developed 6 days after operation.
45	72	M	Had laryngofissure in Philadelphia 12 yrs. previously for carcinoma, grade II, of anterior commissure.	Either recurrence or new growth still intrinsic, Grade II. Total laryngectomy performed.	5 days	Yes	

(Continued)

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THE EVALUATION OF COAGULATION TIME.*

ROBIN HARRIS, M.D.,

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In approaching this subject I took the pulse of the Southern Section by writing to several prominent otolaryngologists concerning their ideas of the value of coagulation time. Clark, of San Antonio stated unequivocally that he believed it of no value, but the hospital in which he works continues to use it as a routine. Steel, of Chattanooga: "I attach no value to coagulation time." Shea said: "We do not find it of service, and the Baptist Memorial Hospital does not require the test." McHenry, of Oklahoma City, Orr, of Nashville, Guyton, of Oxford, and Taquimo, of New Orleans, all thought it might be of some value in a medicolegal way. This may be a way of beating the devil around the stump but I take it that these men as well as many, many others have put very little thought on the subject and are willing to let well enough alone. No subject, it seems to me, is worth while in a medicolegal manner unless proven by scientific facts.

In 1928, I reviewed the ear, nose and throat cases that I had operated on in the Marine Hospital of Memphis and the Veterans Hospital in Memphis. There were 8,700 of these cases in which coagulation time, bleeding time, blood pressure and Wassermann had been made prior to operation. Of this 8,700, I could not find that coagulation time told me in one instance whether the patient was apt to bleed postoperatively. It could hardly be a coincidence that I had to return to the hospital to stop postoperative bleeding in only one patient whose coagulation time was above four minutes, and 72 times for patients whose coagulation time was four minutes or less.

I would like to cite as an illustration two patients operated on this year, both having had submucous resections:

The first, E. B. W., a young outdoor worker, 30 years of age, whose coagulation time was reported to me when I

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entered the operating room as being 11 minutes or more by the ordinary pipette method. The technician said that she had taken the blood from a vein, and that it was 17 minutes and still not finished. I notice by the finished chart that the coagulation time is given, "venous, 25 minutes." This patient had practically no bleeding at the time of operation, which was this same day; there was practically no oozing during the day of operation and there was much less than the average bleeding when the packing was removed from the nose. There was no bleeding after the patient left this hospital, which was within 48 hours.

The second patient was a candidate for aviation school but had been turned down until a badly deviated septum was corrected. I notice by the hospital record that the coagulation time was four minutes and the bleeding time 45 seconds. I did not know this at the time of operation because I never look to see what the coagulation time is. Now, this patient bled a little more than usual at the time of operation and considerably during that day and that night; not enough to be alarming, but constant oozing from nine o'clock in the morning until about eleven at night, so I removed the packing 48 hours after operation, in one side only, because there was more bleeding than I usually encounter. After 48 hours more I removed the packing from the other side and had to use adrenalin several times to stop the bleeding which was more than 500 cc.; however, there was no trouble after the bleeding was finally stopped, and the young man had an uneventful recovery.

CONCLUSIONS.

1. In my opinion coagulation time is not only worthless but puts patients to an unnecessary expense in all hospitals where coagulation time is required as a routine.

2. Any unnecessary expense is an imposition on the patient who already has too many extras added in the hospital.

3. From a medicolegal standpoint, coagulation time is unnecessary because it has not been proven of value.

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Eastern Section—Friday, Jan. 12, 1945—Philadelphia.

Southern Section—Monday, Jan. 15, 1945—Charlotte, N. C.

Middle Section—Wednesday, Jan. 17, 1945—Indianapolis.

Western Section—Saturday and Sunday, Jan. 27-28, 1945—Los Angeles.

The Annual Meeting of the Triological Society will be held at The Drake in Chicago on Monday and Tuesday, May 28 and 29, 1945. Annual meetings of the American Laryngological Association, the American Broncho-Esophagological Association and the American Otological Society, Inc., will continue for the remainder of the week.

Due to the exceptionally heavy demand for guest rooms, it is necessary to make reservations as far in advance as possible. Please advise the hotel the time and date of departure.

CASSELBERRY AWARD OF THE AMERICAN LARYNGOLOGICAL ASSOCIATION

A sum of money having accrued from the Casselberry Fund of the American Laryngological Association, a prize will be offered in 1945 for original investigation in the art and science of laryngology or rhinology. Theses must be in the hands of the Secretary, Dr. Arthur W. Proetz, 1010 Beaumont Building, St. Louis 8, Mo., before March 1, 1945.

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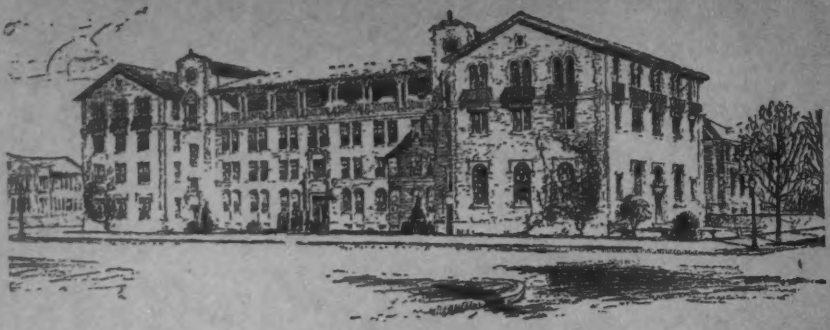

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